

Substitute for form 1449A-B-PTO

Complete if Known

Application Number **09/539,486**  
Filing Date **March 30, 2000**  
First Named Inventor **Sergey A. Selifonov**  
Group Art Unit **Zhou S.**  
Examiner Name **1631**  
Attorney Docket Number **02-028940US**

INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT

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U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, lines, Where Relevant Passages or Relevant Figures Appeal
		Number	Kind Code of Known			
<i>Q</i>	AA	09/539,486		Selifonov et al.	03-30-2000	
<i>Q</i>	AB	4,959,312		Sirokin	09-25-1990	
<i>Q</i>	AC	4,994,379		Chang	02-19-1991	
<i>Q</i>	AD	5,043,272		Hartly et al.	08-27-1991	
<i>Q</i>	AE	5,264,563		Huse	11-23-1993	
<i>Q</i>	AF	5,319,308		Dechene	06-07-1994	
<i>Q</i>	AG	5,408,181		Dechene	04-18-1995	
<i>Q</i>	AH	5,447,839		Manos et al.	09-05-1995	
<i>Q</i>	AI	5,506,793		Stemmer	04-09-1996	
<i>Q</i>	AJ	5,519,319		Smith et al.	05-21-1996	
<i>Q</i>	AK	5,521,077		Kholsa et al.	05-28-1996	
<i>Q</i>	AL	5,565,350		Kmiec	10-15-1996	
<i>Q</i>	AM	5,580,730		Okamoto	12-03-1996	
<i>Q</i>	AN	5,612,205		Kay et al.	03-18-1997	
<i>Q</i>	AO	5,650,722		Smith et al.	07-22-1997	
<i>Q</i>	AP	5,675,253		Smith et al.	10-07-1997	
<i>Q</i>	AQ	5,717,085		Little et al.	02-10-1998	
<i>Q</i>	AR	5,760,012		Kmiec et al.	06-02-1998	
<i>Q</i>	AS	5,789,577		Geysen	08-04-1998	
<i>Q</i>	AT	5,824,469		Short	10-20-1998	
<i>Q</i>	AU	5,869,644		Shortle et al.	02-09-1999	
<i>Q</i>	AV	5,912,119		Radman et al.	06-15-1999	
<i>Q</i>	AW	6,096,548		Stemmer	08-01-2000	
<i>Q</i>	AX	6,117,679		Stemmer	09-12-2000	
<i>Q</i>	AY	6,132,970		Stemmer	10-17-2000	
<i>Q</i>	AZ	6,153,410		Arnold et al.	11-28-2000	
<i>Q</i>	BA	6,159,690		Borrebaeck et al.	12-12-2000	
Examiner Signature <i>[Signature]</i>		Date Considered <i>11/26/01</i>				

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		Office	Number	Kind Code (if known)				
<i>A</i>	BB	WO	00/00632		Phylos, Inc.	01-06-2000		
<i>A</i>	BC	WO	00/37684		KIRS & FELDER	06-29-2000		
<i>A</i>	BD	WO	00/53744		Diversa Corporation	09-14-2000		
<i>A</i>	BE	WO	00/58517		Diversa Corporation	10-05-2000		
<i>A</i>	BF	WO	92/06176		Ixsys, Inc	04-16-1992		
<i>A</i>	BG	WO	97/33957		Amway Corporation	09-18-1997		
<i>A</i>	BH	WO	99/19518		Diversa Corp.	04-22-1999		

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T
<i>A</i>	BI	ALEXEEV ET AL. "Stable and Inheritable changes in genotype and phenotype of albino melanocytes induced by an RNA-DNA oligonucleotide." <i>Nature Biotechnology</i> 1343-1346 (1998)	
<i>A</i>	BJ	ALBERTS ET AL. "Recombinant DNA Technology." <i>New York Publishing, Inc.</i> 291-312 (1994)	
<i>A</i>	BK	ARKIN "Optimizing Nucleotide Mixtures to Encode Specific Subsets of Smino Acids for Semi-Random Mutagenesis." <i>Biotechnology (N Y)</i> . 1992 Mar;10(3):297-300.	
<i>A</i>	BL	ARKIN "An algorithm for protein engineering: Simulations of recursive ensemble mutagenesis." <i>Proc Natl Acad Sci U S A</i> . 1992 Aug 15;89(16):7811-5.	
<i>A</i>	BM	BARLETT "Long-lasting gene repair." <i>Nature Biotechnology</i> 16:1312 (1998)	
<i>A</i>	BN	BOTSTEIN ET AL. "Strategies and Applications of in Vitro Mutagenesis." <i>Science</i> 229:1193-1201 (1985)	
<i>A</i>	BO	CARTER "Site-directed mutagenesis." <i>Biochem J</i> . 237:1-7 (1986)	
<i>A</i>	BP	CARTER "Improved Oligonucleotide-Directed Mutagenesis Using M13 Vectors." <i>Methods in Enzymol</i> 154:382-403 (1987)	
<i>A</i>	BQ	CARTER "Improved oligonucleotide site-directed mutagenesis using M13 vectors." <i>Nucleic Acids Res</i> . 13:4431-4443 (1985)	
<i>A</i>	BR	CHEE ET AL. "Accessing Genetic Information with High-Density DNA Arrays." <i>Science</i> 274:610-614 (1996)	
<i>A</i>	BS	COLE-STRAUSS ET AL. "Correction of the Mutation Responsible for Sickle Cell Anemia by an RNA-DNA Oligonucleotide." <i>Science</i> 1386-1389 (1996)	
<i>A</i>	BT	DALE ET AL. "Oligonucleotide-directed Random Mutagenesis Using the Phosphorothioate Method." <i>Methods Mol. Biol.</i> 57:369-374 (1996)	

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BU	DELAGRAVE "Searching Sequence Space to Engineer Proteins: Exponential Ensemble Mutagenesis." <i>Biotechnology (N Y)</i> . 1993 Dec;11(13):1548-52
BV	DELAGRAVE "Recursive ensemble mutagenesis." <i>Protein Eng.</i> 1993 Apr;6(3):327-31.
BW	DELAGRAVE "Context dependence of phenotype prediction and diversity in combinatorial mutagenesis." <i>Protein Eng.</i> 1995 Mar;8(3):237-42.
BX	<del>Egea Biosciences, Inc. "Pathway to the Proteome"</del>
BY	FODOR ET AL. "Light-Directed, Spatially Addressable Parallel Chemical Synthesis." <i>Science</i> 251:767-777 (1991)
BZ	FODOR "Genome Analysis: Genome Technology." <i>FASEB Journal</i> 11:121 (1997)
CA	FODOR "Massively Parallel Genomics." <i>Science</i> 227:393-395 (1997)
CB	GOLDMAN "An Algrithmically Optimized Combinatorial Library Screened by Digital Imaging Spectroscopy." <i>Biotechnology (N Y)</i> . 1992 Dec;10(12):1557-61.
CC	HILL ET AL. "The structure of granulocyte-colony-stimulating factor and its relationship to other growth factors." <i>PNAS</i> 90:5167 (1993)
CD	KACZOROWSKI ET AL. "Co-operatively of hexamer ligation." <i>Gene</i> 179(1):189-193 (1996)
CE	KARLIN ET AL. "Applications and statistics for multiple high-scoring segments in molecular sequences." <i>PNAS USA</i> 90:5873-5787 (1993)
CF	KAYUSHIN ET AL. "A convenient approach to the synthesis of trinucleotide phosphoroamidites-synthons for the generation of oligonucleotide/peptide libraries." <i>Nucleic Acids Res.</i> 24:3748-3755 (1996)
CG	KREN ET AL. "Targeted Nucleotide Exchange in the Alkaline Phosphates Gene of HuH-7 Cells Mediated by a Chimeric RNA/DNA Oligonucleotide." <i>Hepatology</i> 25(6):1462-1468 (1997)
CH	KREN ET AL. "In Vivo site-directed mutagenesis of the <i>factor IX</i> gene by chimeric RNA/DNA oligonucleotides." <i>Nature Medicine</i> 4(3):285-290 (1998)
CI	KUNKEL "The Efficiency of Oligonucleotide-Directed Mutagenesis." <i>Nucleic Acids &amp; Mol. Biol</i> (1997)
CJ	LING ET AL. "Approaches to DNA Mutagenesis: An Overview." <i>Anal Biochem.</i> 254(2):157-178 (1997)
CK	MEHLING ET AL. "Nucleotide sequences of streptomycete 16S ribosomal DNA: towards a specific identification system for streptomycetes using PCR." <i>Microbiology</i> 141:2139-2147 (1995)
CL	MINTZ ET AL. "EHD1-An EH-Domain-Containing Protein with a Specific Expression Pattern." <i>Genomics</i> 59(1):66-76 (1999)
CM	MUERHOFF ET AL. "Identification of conserved nucleotide sequences within the GB virus c 5'-untranslated region: Design of PCR primers for detection of viral RNA <i>J. Virological Methods</i> 62:55-62 (1996)
CN	NAKAMAYE ET AL. "Inhibition of restriction endonuclease Nci I Cleavage by phosphorothioate groups and its applications to oligonucleotide-directed mutagenesis." <i>Nucleic Acids. Res.</i> 14:9679-9698 (1986)
CO	NEEDLEMAN ET AL. "A General Method Applicable to the Search for Similarities in the Amino Acid Sequence of Two Proteins." <i>J. Mol. Biol.</i> 48:443 (1970)

Examiner  
Signature

*S. Zhou*

Date

Considered

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CP	PATHY "Modular exchange principles in proteins." <i>Curr Opinion in Structural Biology</i> 1:351-361 (1991)
CQ	PATHY "Introns and exons." <i>Curr. Opinion in Structural Biology</i> 4:383-392 (1994)
CR	PEARSON ET AL. "Improved tools for biological sequence comparison." <i>PNAS</i> 85:2444 (1988)
CS	PORTER ET AL. "Direct PCR Sequencing with boronated Nucleotides." <i>Nucleic Acids Res.</i> 25(8):1611-1617 (1997)
CT	ROBLES "Hydropathy and Molar Volume Constraints on Combinatorial Mutants of the Photosynthetic Reaction Center." <i>J Mol Biol.</i> 1993 Jul 5;232(1):242-52.
CU	SAYERS ET AL. "5'-3' Exonucleases in phosphorothioate-baised oligonucleotide-directed mutagenesis." <i>Nucleic Acids Res.</i> 16:791-802(1988)
CV	SAYERS ET AL. "Strand specific cleavage of phosphorothioate-containing DNA by reaction with restriction endonucleases in the presence of ethidium bromide." <i>Nucleic Acids Res.</i> 16:803-814 (1988)
CW	SMITH "In Vitro Mutagenesis." <i>Ann. Rev. Genet.</i> 19:423-462 (1985)
CX	SMITH ET AL. "Comparison of Biosequences." <i>Adv. Appl. Math</i> 2:482 (1981)
CY	STRAUSS "The Site-Specific Correction of Genetic Defects." <i>Nature Medicine</i> 4:274-275 (1998)
CZ	TAYLOR ET AL. "The use of phosphorothioate-modified DNA in restriction enzyme reactions to prepare nicked DNA." <i>Nucleic Acids Res.</i> 13:8749-8764 (1985)
DA	TAYLOR ET AL. "The rapid generation of oligonucleotide-directed mutations at high frequency using phosphorothioate-modified DNA." <i>Nucleic Acids Res.</i> 13:8765-8787 (1985)
DB	VIRNEKAS ET AL. "Trinucleotide phisphoramidites: ideal reagents for the synthesis of mixed oligonucleotides for random mutagenesis." <i>Nucleic Acids Res.</i> 22:5600-5607 (1994)
DC	VON DER OSTEN ET AL. "Protein engineering of subtilisins to improve stability in detergent formulations." <i>J. Biotechnol.</i> 28:55-68 (1993)
DD	WELLS "Importance of hydrogen-bond formation in stabilizing the transition state of subtilisin." <i>Trans. R. Soc. Lond.</i> A317:415-423 (1986)
DE	WHIPPLE ET AL. "Application of Genetic Algorithms to Combinatorial Synthesis: A Computational Approach to Lead Identification and Lead Optimization." <i>J. AM. Chem Soc.</i> 118:1669-1676 (1996)
DF	XIANG ET AL. "Targeted gene conversion in a mammalian CD34+-enriched cell population using a chimeric RNA/DNA oligonucleotide." <i>J. Mol. Med.</i> 75:829-835 (1997)
DG	YOON ET AL. "Targeted gene correction of episomal DNA in mammalian cells mediated by a chimeric RNA-DNA oligonucleotide." <i>PNAS</i> 93:2071-2076 (1996)
DH	YOKOMORI ET AL. "A Similarity measure for DNA sequence analysis based on locality." <i>Genome Inf. Ser.</i> 4:283-292 (1993)
DI	YOUNG ET AL. "Characterization of the Receptor binding determinants of granulocyte colony stimulating factor." <i>Protein Science</i> 6:1228-1236 (1997)
DJ	YOUVAN "Imaging Sequence Space." <i>Nature.</i> 1994 May 5;369(6475):79-80.
DK	ZOLLER "New recombinant DNA methodology for protein engineering." <i>Curr. Opinion in Biotechnology</i> 3:348-354 (1992)

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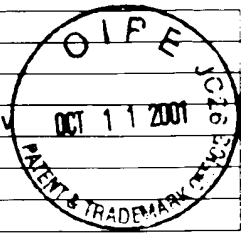
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<i>AA</i>	AA	5,066,584		Gyllenstein et al.	11/19/1991	

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FOREIGN PATENT DOCUMENTS

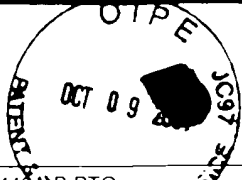
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RA	AA	6,188,965	B1	Mayo et al.	02-13-2001	
GA	AB	6,269,312	B1	Mayo et al.	07-31-2001	

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RA	AC	WO	00/23564	A2	Xencor, Inc	04-27-2000	

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RA	AD	CHAMBERLAIN ET AL. (1990) "Multiplex PCR for the Diagonosis of Duchenne Muscular Dystrophy." <i>PCR Protocols</i> 272-281.			
RA	AE	HAYASHI ET AL. (1994) "Simultaneous Mutagenesis of Antibody CDR Regions by Overlap Extension and PCR." <i>BioTechniques</i> 17(2):310-315.			
GA	AF	JIRHOLT ET AL. (1998) "Exploiting sequence space: shuffling in vivo formed complementarity determining regions into a master framework." <i>Gene</i> 215:471-476.			
GA	AG	KOBAYASHI ET AL (1997) "Analysis of Assembly of Synthetic Antibody Fragments: Expression of Functional scFv with Predefined Specificity." <i>BioTechniques</i> 23(3):500-503.			
GA	AH	PRODROMOU ET AL (1992) "Recursive PCR: a novel technique for total gene synthesis." <i>Protein Engineering</i> 5(8):827-829.			
GA	AI	SODERLIND ET AL.(1999) "Complementarity-determining region (CDR) implantatio: a theme or recombination." <i>Immunothnology</i> 4:279-285.			
GA	AJ	SODERLIND ET AL.( 2000) "Recombining germline0derived CDR sequences for creating diverse single-framework antibody libraries." <i>Nature Biothecnology</i> 18:852-856.			
GA	AK	SODERLIND ET AL. (1995) "Domain libraries: Synthetic diversity for de novo design of antibody V-regions." <i>Gene</i> 160:269-272.			

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